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Conference Abstract

Data Fitness for Monitoring the Status of Biological Invasions: Lessons from South Africa

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Abstract

In November 2018, South Africa published the first *National Status Report on Biological Invasions and Their Management* (SANBI and CIB 2018). This report represents a milestone for the Republic of South Africa and the world since it is believed to be the first comprehensive national-scale assessment for biological invasions. Moreover, the report is a formal mechanism to increase the connectivity between research, policy, and implementation, and it will be followed by assessments every three years.

Data used in the report originated from a range of data sources, including formal and grey data repositories, atlas data, published scientific papers, theses, inputs from experts and practitioners, and management records from government agencies and Non-Governmental Organizations (NGOs). Several important data gaps were identified during data collection and analysis. These data gaps are largely due to a lack of a central data repository, inconsistent species checklists, data transparency, and data interoperability (due in part to a lack of consistent definitions, taxonomic classification, and use of varying data standards).

To address these data gaps, the team identified several forms of databases and requested access to the data. The data received required that the team perform a preliminary validation for metadata and data completeness. Parallel to the process of sourcing and validating the data, the team compiled three comprehensive national alien and invasive

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species checklists, which were then verified and validated by taxonomists. These processes were followed by adopting and developing metrics to prepare data for analyses.

The team identified, notwithstanding the numerous data classification schemes available, *A Proposed Unified Framework for Biological Invasions* (Blackburn et al. 2011), and *the Environmental Impact Classification for Alien Taxa* (EICAT) Scheme (Hawkins et al. 2015). These two classifications were used to assess the status of species introduction and impact, respectively. Other metrics that were developed include the confidence level metrics to assign the validated data to the indicators and criteria for reviewing area-based invasive species management plans.

Finally, the data were used to assess four aspects of the report: pathways of introduction; status of alien species; status of invaded areas; and effectiveness of control measures and regulations. A total of 21 indicators were developed to assess the status of these aspects. In addition, four high-level indicators (one for each aspect) were developed for use in the national suite of environmental indicators on which the Department of Environmental Affairs reports on a regular basis.

The next steps include communicating and interpreting the indicators as part of the final report; developing monitoring and reporting systems in an attempt to fill the data gaps; testing and refining the indicators with stakeholders; continuously validating and verifying the alien and invasive species checklists with a wider network of country experts; and building simulation models to assess the inter-relationship and value of indicators.

Keywords

status of biological invasions, data fitness, monitoring biological invasions, data classification schemes, alien & invasive species

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